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Security Review:

"Biological Diversity: The Economy of Investing in Ecology for National Security"

by CDR Andrew Singer

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National Defense University
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Biological Diversity: The Economy of Investing In
Ecology for National Security

Core Course Four Short Essay

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Prologue

Worth Fighting or Dying For?

During World War II, the Nazis attempted to starve out the resistance in Leningrad. Over the course of this Nazi blockade over 600,000 people starved to death. The Vavilov Institute, a botanical and agricultural research center in Leningrad, was home to thirty one scientists whose mission was to guard a unique collection of plants and seeds. While the bombs fell around the ruins of the city, the scientists steadfastly kept to their task. For some of the species of food crops the collection represented the last remaining link between the crop's past and future. Throughout the bombardment the scientists planted new generations to freshen the plants genetic content. Guarding these genetic treasures fourteen of the thirty one starved to death rather than consume the sacks of plants and seeds to include rice and potatoes. The Institute's rice specialist, Dr. Dmytry S. Ivanov died at his desk surrounded by bags of rice having, shortly before his death, said "When all the world is in the flames of war, we will keep this collection for the future of all people." The surviving scientists did just that --two thirds of the world's wild strains of wheat are still maintained at the Vavilov seedbank.¹ The courage and sacrifice of the scientists to protect unique natural resources is a poignant illustration of the immeasurable value of biological diversity.

To illustrate why the scientists gave their lives rather than reduce available gene resources Dr. Paul Ehrlich, best known for postulating the theory of Nuclear Winter resulting from a nuclear war, says "extrapolation of current trends in the reduction of diversity implies a denouncement for civilization within the next 100 years comparable to a nuclear winter."²

Preserving diversity can be fiscally significant. A wild grass (genetically related to corn) found in Mexico is assessed to hold a genetic key to creating a perennial hybrid of corn that could prove to have a commercial value of \$6.82 billion.³

Does the future hold significant threats, as the Vavilov scientists said, "to the future of all people"? Is there a strategy to preserve our "collection" and with it our national security?

¹ "The Story of the Vavilov Institute", *Diversity*, Vol. 7, no. 1&2, pg. 10-14, 1991.

² Paul Ehrlich "The Loss of Diversity" *Biodiversity* Edward O. Wilson ed., National Academy Press, Washington DC, pg. 22, 1988.

³ Bryan Horton "Commodity, Amenity and Morality", *Biodiversity* Edward O. Wilson ed., National Academy Press, Washington DC, pg. 202, 1988.

Introduction

Terrorism, drug trafficking, human rights, refugee flows, and the control of weapons of mass destruction have been the foci of United States Government efforts to protect our national interests and preserve our national security. Certainly these are urgent concerns, but a comprehensive national security strategy must also address food and water resource needs, especially control and access to a diversity of biological resources. In this paper, I review the value of "biodiversity" and its importance to our national security, discuss the factors that make biodiversity issues difficult to resolve, and offer recommendations to strengthen our position in what is likely to become a world ecological conflict.

The Value of Biodiversity

Natural resources have been at the heart of many battles throughout history. The Ecuador and Peru border dispute, tensions over the Spratley Islands in the South China Sea, protests over India's damming of the Ganges River, oil disputes in the Middle East are a few among many painful reminders that conflict can arise over ownership of natural resources. Food sources are paramount in the list of natural resource issues that create international havoc. Vice President Gore, in his best selling book Earth in the Balance, writes: "Nothing links us more powerfully to the earth -- to its rivers and soils and its seasons of plenty -- than food"¹ Native Americans fought settlers over buffalo, North Americans fought South Americans in "Banana Wars", Arabs rioted over access to food in the early 1980's, and Somalia and Bosnia interventions centered on food distribution efforts

Securing access to food means securing access to biological resources and preserving what has become known as "biodiversity." Biodiversity is defined as the totality of genes, species, and ecosystems in a region. Scientists have long held that biodiversity is critical to food security. As food crops develop resistance to pests and chemicals, substitute crops are sought. Biodiversity allows such substitution to take place. More recently, biodiversity has proved to be critical to the pharmaceutical

industry. New drugs are developed daily from the vast stores of biological resources across the world. Biodiversity is so important that the United Nations maintains dozens of gene banks scattered around the world to preserve biodiversity. Here in the United States, the Department of Agriculture funds several domestic gene banks at a cost of tens of millions of dollars annually.²

No one has put a price tag on biodiversity but clearly it is of economic interest. During the last decade, US policy had focused on protecting commercial investments in biodiversity. In part, this is due to the strong interest of the pharmaceutical industry which has pushed our government to secure ownership of biological resources, estimated to be worth tens of billions of dollars annually to this one industry alone. The Congress has responded and recognized "an important link between the protection of the environment and biodiversity and economic growth."³

However, US policymakers have been slow to connect biodiversity issues to national security, despite growing international tensions in this area. For example, it is not uncommon for industry scientists to disappear on plant prospecting trips in Latin American countries. Ethiopia is the first country to close its borders to scientific expeditions for fear that biological resources would be stolen by foreigners. In 1991 a part of world's collection of wheat germplasm was evacuated from Syria to protect it from any spill over from the Gulf war.⁴ Regional and world food supplies and stability are literally the seeds of geostrategic conflict and require regional collaboration.

Efforts to build international consensus on biodiversity preservation and distribution are underway. More than a decade ago the United Nations began lengthy biodiversity negotiations. These negotiations culminated in the "Convention on Biological Diversity", a proposed international agreement presented for world consideration at the 1992 Earth Summit in Rio. The debate over this Convention and attendant recommendations for a global biodiversity strategy has been fierce and, despite years of discussion, important issues remain unresolved.

The United States, like many industrialized nations, is slowly coming to realize the strategic importance of biodiversity. A step in the right direction was taken last July when *A National Security Strategy of Engagement and Enlargement* recognized, for the first time that “an emerging class of transnational environmental issues are increasingly affecting international stability and consequently will present new challenges to US strategy”.⁵ But more needs to be done to protect US interests in biodiversity. As Vice President Gore has said, biodiversity is “the single most serious strategic threat to the global food system”⁶

Factors Creating Biodiversity Problems

Biodiversity confounds policymakers in the United States and the world over. As a result, there are no widely accepted models or theories on how to protect biodiversity or fairly distribute its benefits. At least four factors account for why biodiversity lies at the heart of many unresolved geostrategic challenges.

Factor 1: Uncertain Ownership

As Jack Kloppenburg in *Seeds and Sovereignty* says, our history of commingling biological resources has created “great global interdependence”.⁷ Two factors make it close to impossible to determine the country of origin of most biological resources. First, seeds have always moved all over the world first by nature and later by man. Second, political boundaries have dramatically changed over time. Steve Witt in *Biotechnology and Genetic Diversity* sums it up best: “Tracking a portion of germplasm through its history is like tracking a gallon of sea water through its history. It can’t be done.”⁸

The Convention on Biological Diversity proposes an uneasy balance between the country of origin concept and joint international ownership. The Convention is an attempt to form an unprecedented international agreement based on the common purpose of ecological and economic collaboration. It does this by: calling for domestic actions to conserve biodiversity; encouraging the sustainable use of biodiversity, and promoting benefit sharing.” At the same time, the Convention

recognizes "sovereign rights" of nations over their genetic resources. This allows countries to add genetic resources to their lists of tradable goods

Despite the Convention and the inherent difficulty of calculating original ownership of biological resources, many countries continue to insist that this is the best method available. Even some policymakers in the United States, a country that most scientists agree has few valuable indigenous biological resources, cling to the country of origin method and reject the delicate balance proposed by the Convention.

Factor 2: Uneven Distribution of Resources

Herein lies the geostrategic issues: Two thirds of the world's biodiversity exist in the tropics yet the biotechnology industry that depends on biodiversity is located in industrialized countries in temperate zones with little biodiversity. Protection of the US biotechnology industry was the reason cited by the Bush Administration for its refusal to sign the Convention on Biological Diversity in 1992. At that time, The United States argued that the Convention would impinge on intellectual property rights and inhibit incentives for biotechnological development. Ironically, many less developed countries argued that the Convention actually favored the US biotechnology industry by providing US company's access to biodiversity without having to significantly invest in the developing world ¹⁰

Factor 3: Incompatible Property Rights Regimes

At the core of the debate on the Convention on Biological Diversity was differing views on property rights. Until recently, most of the world agreed that genetic resources were the "common heritage of mankind."¹¹ The newly recognized commercial value of biodiversity has caused a "bio-rush" by the industrialized world to claim ownership and develop biological resources. By modifying (even slightly) plant genetic resources and patenting them, biotechnology firms can secure potentially huge patent earnings. The United States is leading the developed world in pushing for extensive applicability of private property rights for biodiversity

Since 1930, the United States has assigned intellectual property rights to plants through a complex process run by both the Department of Commerce and Department of Agriculture.¹² As one of the few countries in the world that allows for the patenting of living things, the US biotechnology industry has a comparative advantage. The United States efforts to protect patent rights are seen as a threat to less developed country's territorial integrity. For example, a US company could discover a plant genetic resource in Brazil's Amazon, ever so slightly engineer it and claim its property rights and associated royalties with Brazil getting no benefits. Vice President Gore describes the tensions:

Though much of the current suspicion of plant breeders by the Third World is unjustified, it is also not hard to understand. Developments such as the new US law providing patent protection and private ownership of new crop varieties, along with protectionism by the European common market, Japan, and others, have fueled cynicism in the developing world and led to new efforts to move toward more equitable economic relationships.¹³

Factor 4: Lack of US Leadership

The United States has failed to develop a consistent policy on biodiversity and continues to give mixed signals as to our intentions in this area toward biodiversity. When President Clinton assumed office, he made good on his campaign promise to sign the Convention on Biological Diversity. However, the United States signing of the Convention is viewed by many nations as disingenuous. It seems that when the Clinton Administration signed the Convention, it also released an "interpretive statement" stating that the treaty would conform to the "international system of intellectual property rights" ¹⁴ (meaning the US system of property rights). Since Article 37 of the Convention states that "no reservations may be made to the Convention" it remains unclear whether the United States is a true signatory to this international agreement.

The National Security Strategy released in 1994 remains relevant especially with the Clinton Administration's uncertain position on biodiversity. The document reads:

Increasing competition for dwindling reserves of contaminated air, arable land, fisheries and other food sources, and water once considered "free" goods is already a very real risk to regional security around the world. The range of environmental risks serious enough to jeopardize international stability extends to massive population flight from man made or natural catastrophes, ...to large scale ecosystem damage caused by industrial pollution, deforestation, loss of biodiversity, ozone depletion and ultimately climate change. Strategies dealing with environmental issues of this magnitude will require partnerships ...,and a commitment to a strategically focused, long term policy for emerging environmental risks. *[Emphasis added]*¹⁵

The lack of clarity on the part of the United States with regard to the Convention, internal disagreements over the appropriate role of the United States in biodiversity, and the failure of US policymakers to invest the necessary time in debating biodiversity, has left ill will with many countries around the world. The developing world is especially suspicious of US economic and environmental intentions and this is key to geostrategic considerations in the western hemisphere as was acknowledged by Vice President Gore in *Earth in the Balance* noted in the case that follows

The Case Of Brazil

Most US policy has focused on Brazil because it is viewed as the most promising market for US goods in the Southern Hemisphere. However, US policy must also calculate in the fact that Brazil is our most promising biodiversity reserve. Brazil's precious treasure -- the Amazon, is the world's largest and most diverse biosphere. Within its borders, Brazil controls 30 percent of the world's tropic forest (357 million hectares). The country is home to far more primates than any other country -- 27 percent. Over 26 percent of the world's crops are genetically tied to Brazil. Between 50 to 70 percent of the planet's species reside in the Amazon. At last count, over 25 percent of pharmaceuticals contain ingredients derived from tropical plants like those of the Amazon ¹⁶

Brazilian leaders know that they must protect their biological reserve from foreign invaders and this is foremost in the minds of their national security experts. The past has taught them tough lessons on the need to maintain their biodiversity. Vice President Gore recounts some relevant history:

...the perceived inequity of the current arrangements in the global food system has led to the Third World's distrust of efforts on the part of multinational corporations to continue retrieving wild crop relatives from their centers of genetic diversity. There have been after all, a number of historic examples of advanced nations taking genetic treasures from developing countries without proper compensation. The first steamship ever to sail up the Amazon River to Manaus, Brazil left in the middle of the night with a cargo of rubber tree plants -- at that time the principal source of Brazil's income. ...they were transplanted to the British colony of Ceylon the following year. Its monopoly in the rubber market broken, Brazil saw its economic fortunes plummet. Manaus, which had been the richest city in the new world, with dazzling electric lights and even a famous opera house, literally turned out its lights less than two years later.¹⁷

US policymakers must understand that the history of the rubber plant and other instances of theft have left many Brazilians anticipating additional raids on their biological reserves. Many in Brazil cite a paper published by Lyndon LaRouche that draws an analogy between the US intervention in the Gulf War to maintain access to oil and a future scenario that has the United States undertaking a similar intervention in Brazil to protect US interests in the biological resources of the Amazon.¹⁸

Today, one of Brazil's largest projects is a multimillion dollar air surveillance system by Raytheon covering north and western Brazil with near complete coverage over the Western Amazon. The Latin American perceived history (sometimes unfactual) of United States economic and military intervention and economic negotiations in South America are not only of concern to Brazil and should be considered across the entire geostrategic context of Latin America. The United States' actions with regard to the Convention on Biological Diversity played to fears that the United States may not respect nation's, in particular Latin America's and Brazil's

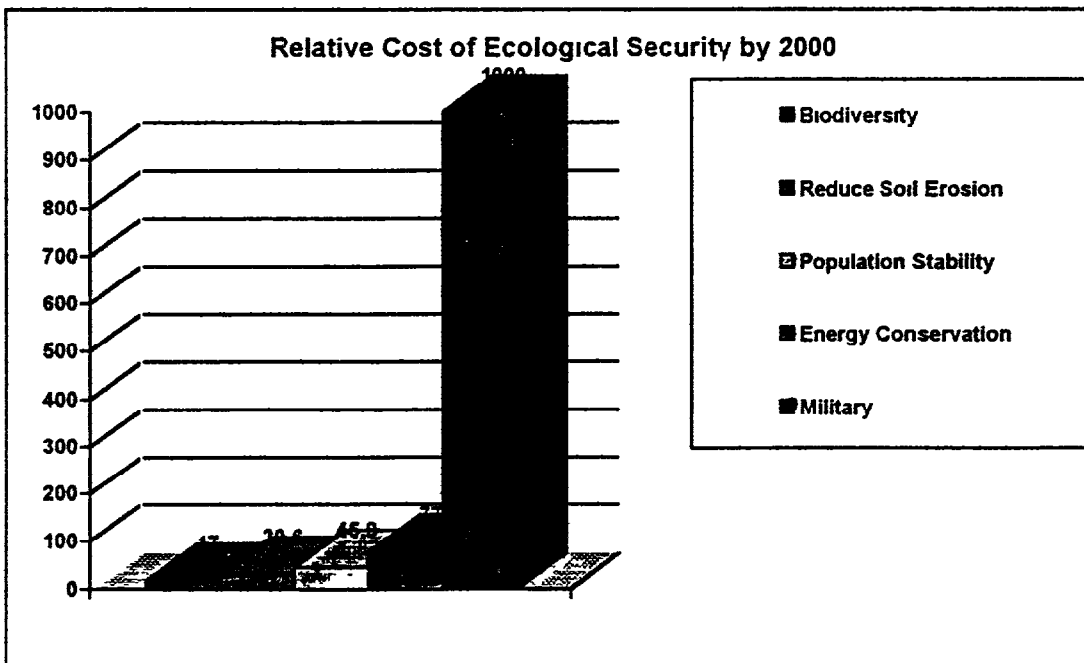
valued diversity which has ramifications to their economic and ecological security, therefore their national security

It is important to note that even a country as rich in biodiversity as Brazil is not self-sufficient and must also seek international agreements on biodiversity. The transnational nature of biodiversity is illustrated by coffee, an important Brazilian crop. Despite the riches of the Amazon, Brazilian scientists find it necessary to combat new pests or blights by turning to Ethiopia where other coffee genes are found. The biodiversity interdependence between countries provides the opportunity to develop international agreements over ownership and exchange.

Recommendations

Develop a National Strategy

First, the United States should devise a strategy to invest more in collaborating with biologically diverse nations. As this graph illustrates, the UN estimates the following relative cost of ecological security by the year 2000:¹⁹



The United States must lead the world in an investment strategy based on benefit sharing not defense. The interpretive statements appended to the United States

signatory of the Convention on Biological Diversity should be withdrawn. The need for US leadership in this strategic issue is clear -- as the United States goes so does world policy and cooperation. As more and more international agreements (e.g. NAFTA & GATT) are signed, US companies make substantial investments in future prospects relating to these agreements resulting in greater world interdependence, especially in food. The United States, in particular the US Department of Defense (DoD) which regularly leads many domestic and international policy issues, must exert their leadership in this strategic issue.

Exert Increased DoD Leadership

As the National Biologic Survey -- an agency in the US Department of the Interior, recommends: "Other agencies such as...and Department of Defense also need additional funding in this area [biodiversity]." ²⁰ In a just released National Academy of Science grant, the Commission on Life Sciences will study the "noneconomic and economic value of Biodiversity". ²¹ In its lead paragraph, DoD is cited as a sponsor. The project proposal states:

The Department of Defense [DoD] has indicated a desire for advice from the National Research Council on developing a framework for applying to land management our scientific knowledge of the economic and noneconomic value of biodiversity, and on ways that the Department may use this knowledge base in its Legacy and other land management programs. The framework would be based on the state-of-the-art understanding about the value of biodiversity but take into account risks and uncertainties associated with application of current knowledge. ²²

While most of DoD's interest will regard its land management function, its involvement in biodiversity is a glowing example of the new level of thinking required to increase awareness of biodiversity and its value. Leading US Latin America Security Strategists Gabriel Marcella and Fred Woerner now include ecology issues in a proposed strategy for the Western Hemisphere. It includes an agenda item to "develop military and police capabilities to protect both the natural environment and the use of fiscal resources" ²³

Comply With the Convention on Biological Diversity

The credibility of the United States is at issue. The Convention on Biological Diversity alone will not conserve biodiversity as pollution, population, and the market are the three principal pressures threatening biodiversity. Population and market usually work in concert.²⁴ If the United States wishes to continue to exert strong influence in the security and stability of the world, lead the world's prosperity, and shape global environmental policies, it must be willing to make a significant investment in the world market and assist nations in their efforts to control population and eliminate pollution.

Global environmental policies have direct impact on our quality of life --fiscally and physically. US policy needs to include favorable credit and trade terms as well as alternative development opportunities to help conserve biodiversity. One relatively small but symbolically great "cost" is to respect the process of and adhere to the Convention of Biological Diversity. This investment would ensure favorable solutions to future international security concerns and continued access to invaluable natural and commercial resources.

Broaden Our View of National Security

Finally, and most importantly, we need to broaden our view of what is strategically important. This is becoming increasingly more obvious in the post Cold War era. The root causes of some of the world's fiercest conflicts have been over biodiversity and its core confrontations over ownership, control, and profit. These core issues along with a traditional reaction to control access leads to confrontation. These issues will continue to be key elements in biodiversity's geostrategic context --a context that requires benefit sharing and respect of the host nation's resources be considered in developing US national security strategy. The transnational factors and actors involved require a shift in conventional thinking from reaction to threats to an opportunity based strategy. By taking a broader view of opportunities we can prevent future confrontations. A lot of countries in the developing world are calculating in biodiversity as they develop their national security strategy, it is time we do the same

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